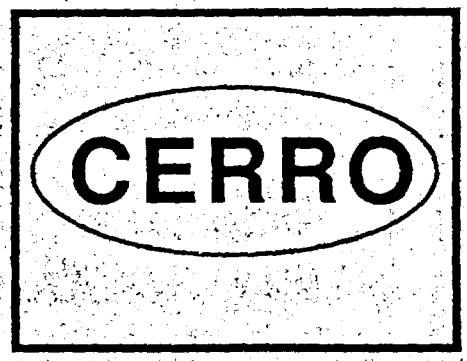

FIELD SAMPLING REPORT
PCR MONITORING

Prepared for

Cerro Copper Products Company
Sauget, Illinois

DECEMBER 1988

Sverdrup

IK.05
12/1/88
153542

FIELD SAMPLING REPORT

PERIODIC COMPLIANCE REPORT MONITORING

CERRO COPPER PRODUCTS COMPANY
SAUGET PLANT
SAUGET, ILLINOIS

Prepared By

SVERDRUP CORPORATION
ST. LOUIS, MISSOURI

December 1988

FOREWORD

Sverdrup Corporation was retained by Cerro Copper Products Company in December 1987, to conduct Periodic Compliance Report (PCR) monitoring involving various wastewater discharges associated with the Sauget Plant. The field activities related to the work involved:

1. Preparation of Sampling Locations/Flow Monitoring Equipment
2. Collection of Wastewater Samples
3. Collection of Flow Rate Data

Activity 1 took place on December 5, 1988, and Activities 2 and 3 were performed over a 24-hour period beginning the morning of December 6, 1988.

This report presents the field and analytical results related to the PCR monitoring for all locations. Its purpose is to present the data obtained for reasons of documentation and future use by Cerro.

TABLE OF CONTENTS

I DESCRIPTION OF SAMPLING LOCATIONS

This section provides a brief description of each of the sampling locations, including the significance of the discharge, the flow monitoring method, and specific sample collection points.

LOCATION 3-B

Sampling Location 3-B is at the lift station just north of Tube Mill No. 2 (see Figure I-1). The sampling point was the discharge from a 12-inch diameter cast iron pipe entering the wet well from the east. The flow in the pipe represents the wastewater discharge from the Copper Forming operations at Tube Mill No. 2, with the exception of some sanitary wastewater that enters the wet well via a 6-inch diameter cast iron pipe adjacent and above the sampling point.

The wet well is approximately 15 feet deep with the sampling point approximately 4 feet off the bottom. Flow rate was monitored by means of a 90 degree V-notch weir insert installed in the 12-inch diameter pipe and a portable continuous flow meter. Samples were collected from the flow exiting the weir by a portable automatic sampler.

LOCATION 8-A

Sampling Location 8-A is at the inlet manhole located along the main plant road just west of the Control Center (see Figure I-1). The flow entering the manhole from the west represents the process flow from the wet-processing areas of the Secondary Copper operations located in the central part of the plant complex. Other flow discharging to the manhole includes stormwater flow from several inlets in the sewer system upstream of the manhole and flow associated with the plant laboratory discharging west from the Control Center.

The manhole is approximately 6 feet deep with a 4-inch and two 12-inch diameter clay entrance lines and a 12-inch diameter clay exit line. Flow rate was monitored by means of a 90 degree V-notch weir insert installed in the 12-inch clay pipe entering from the west and a portable continuous flow meter. Samples were collected from the flow existing the weir by a portable automatic sampler.

LOCATION 9-A

Sampling Location 9-A is at the lift station just north of Shaft Furnace Building No. 19 (see Figure I-1). The sampling point was the discharge from a 12-inch diameter cast iron pipe entering the wet well from the west. The flow in the pipe represents the overflow/spillage from the cooling towers and process tankage associated with the Direct Chill Casting operations at Building No. 19.

The wet well is approximately 12 feet deep with the sampling point approximately 4 feet off the bottom. Flow rate was monitored by means of a 90 degree V-notch weir bolted to the wall in front of the 12-inch pipe and a portable continuous flow meter. Samples were collected from the flow exiting the weir by a portable automatic sampler.

SAMPLING LOCATION 12-C

Sampling Location 12-C is the discharge from the East Outfall Lift Station located at the extreme northeast sector of the plant (see Figure I-1). The flow discharging the lift station represents the majority of the process wastewater, sanitary wastewater, and stormwater leaving the plant site that is associated with the Copper Forming and Secondary Copper operations at the plant. Monitoring at this location allows full quantificiation of the pollutant discharge rates leaving the plant complex via the East Outfall.

Samples were collected by a temporary automatic sampler installed at the lift station. The sampler was in the form of a flow splitter that diverted a portion of the pumped flow to a sample collection container during the operation of the lift station pumps. Flow rate was monitored with a permanent sonic-type flow meter designed to monitor and record the discharge from the lift station.

CERRO WEST

Sampling Location Cerro West is at the inlet manhole at the west entrance to the plant located east of Mississippi Avenue (see Figure I-1). Monitoring at this location allows full quantification of pollutant discharge rates leaving the plant complex via the West Outfall. It includes all flow discharged from the lift stations at Building 19 and Tube Mill No. 2, stormwater from the main parking area, and sanitary flow contributed from the Administration Building, Cafeteria, and Gate House.

The manhole is approximately 12 feet deep and serves as access to an 18.0-inch Leopold Lagco permanent flume installed in an 18-inch diameter clay pipe. Samples were collected at the discharge from the flume by a portable automatic sampler. Flow rate was monitored by a permanent sonic-type flow meter installed at the West Outfall.

SAMPLING LOCATION 30 (COPPER MOLDING & CASTING TREATMENT PLANT)

Sampling Location 30 is the discharge from the metals removal treatment system for the blowdown from the casting furnace air pollution scrubber. A single grab sample was collected form the clarified portion of one of the batch tanks.

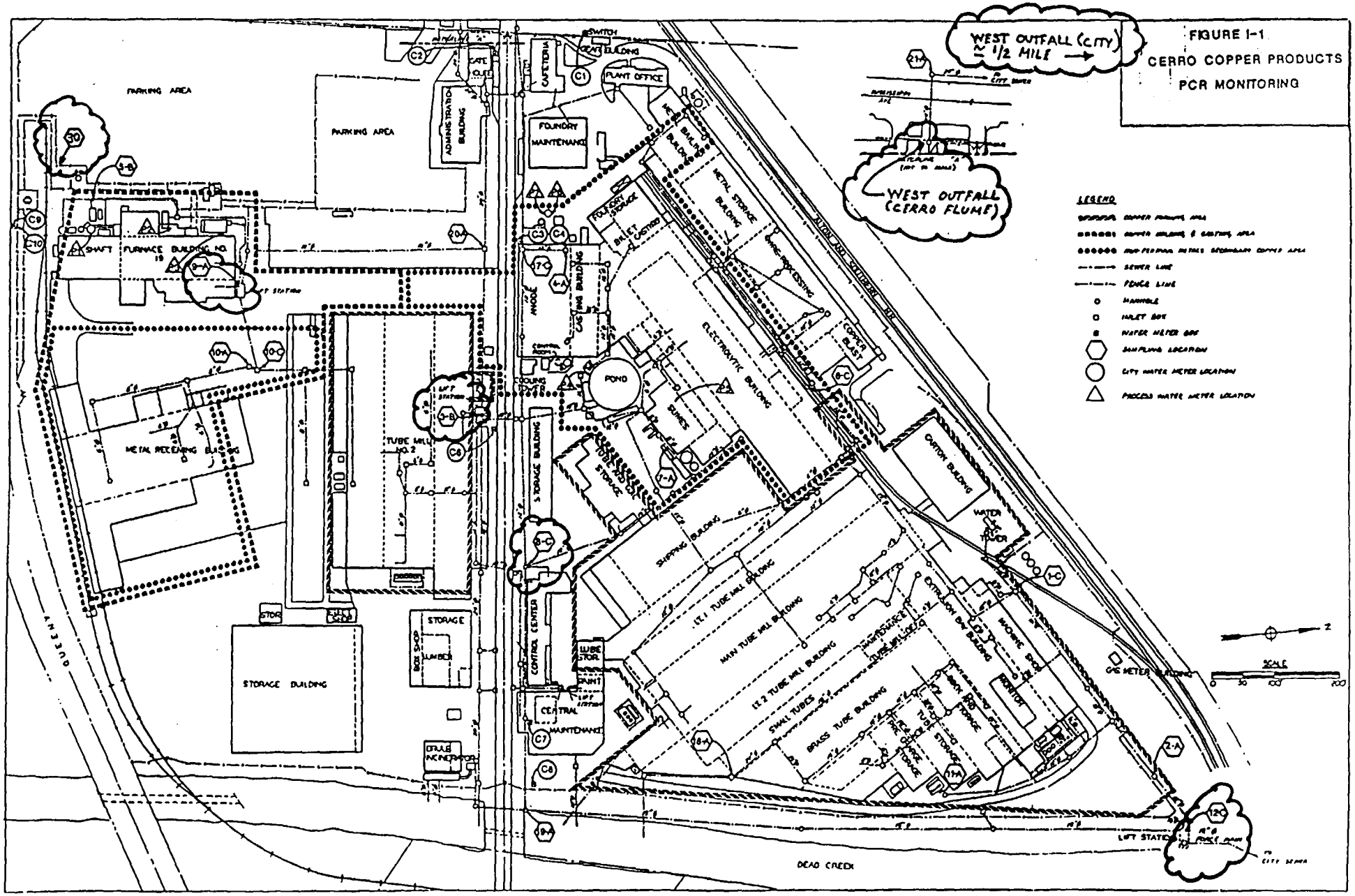
FIGURE I-1
CERRO COPPER PRODUCTS
PCR MONITORING
WEST OUTFALL (CITY)
~ 1/2 MILE
WEST OUTFALL
(CERRO FLUME)
LEGEND
SEWER LINE
FENCE LINE
MANHOLE
INLET BOX
WATER METER BOX
SAMPLING LOCATION
CITY WATER METER LOCATION
PROCESS WATER METER LOCATION
PARKING AREA
PARKING AREA
PLANT OFFICE
FOUNDRY MAINTENANCE
ADMINISTRATION BUILDING
CAFETERIA
METAL STORAGE BUILDING
FURNACE BUILDING NO. 19
SHAFT
POND
ELECTROLYTIC BUILDING
CASTING BUILDING
ANODE
TUBE MILL NO. 2
METAL RECEIVING BUILDING
STORAGE BUILDING
STORAGE
BOX SHOP
LUMBER
CENTRAL MAINTENANCE
CONTROL CENTER
STORAGE BUILDING
SHIPPING BUILDING
MAIN TUBE MILL BUILDING
NO. 1 TUBE MILL BUILDING
NO. 2 TUBE MILL BUILDING
SMALL TUBES
BRASS TUBE BUILDING
MAINTENANCE
EXTRUSION BAR BUILDING
MACHINE SHOP
MONITOR
CAUSTIC BUILDING
WATER SOFTENER
GAS METER BUILDING
LIFT STATION
DEAD CREEK
QUEENY
SCALE

II SAMPLE COLLECTION/FLOW MONITORING PROCEDURES

SAMPLE COLLECTION

Both grab and flow-proportional composite samples were collected to prepare the sample bottles needed for the required analyses. Some of the individual grab samples were used to compile 24-hour flow-proportional composite samples for metal analysis. (See Table II-1 for a summary of the type of bottles and preservatives used.)

Grab Samples

Grab samples were collected on 4-hour intervals during the 24-hour sampling period for metals, total phenols, oil & grease, and the water chemistry parameters. In addition, end of period grab samples were collected for VOA analysis at each of the sampling locations. Grab samples also were collected for all parameters of the discharge from the treatment plant associated with the copper molding and casting operations (Location 30). The grab samples were collected by engaging the mechanical sampler at each location. All grab samples were placed on ice after collection.

Composite Samples

Twenty-four hour flow-proportional composite samples were collected at each sampling location (except Location 30 Treatment Plant) by mechanical samplers. The samples were collected in bottles that were packed in ice. The samples were mixed thoroughly and used to prepare the sample bottles for NVBN + NVA, metals, water chemistry, phenolics, and oil & grease (See Table II-1). All samples were placed on ice after preparation.

In addition, flow-proportional composite samples for metals analysis were prepared by the analytical laboratory for each sampling location. A data sheet that listed the percentage of sample required from each grab sample based on the flow rates measured during the six 4-hour sampling periods was compiled for each location. Table II-2 provides a summary of the data compiled for the preparation of the composite samples.

FLOW MONITORING

Wastewater flow rate and quantity were monitored at each location except Location 30 during sample collection. This was accomplished by totalizing/recording flowmeters at all locations except Location 3-B and 12-C. At Location 3-B and 12-C, only total flow was recorded. Table II-3 provides a summary of the flow measurement devices for each sampling location.

TABLE II-1

SAMPLE BOTTLES AND PRESERVATIVES

Analysis	Bottle Type	Size	Preservative
VOA(1)	Clear Glass	40 ml	Ice
NVBN + NVA(2)	Amber Glass	1 gal	Ice
Metals(3)	Brown Plastic	1000 ml	Nitric Acid
Water Chemistry(4)	White Plastic	1/2 gal	Ice
Phenolics	Amber Glass	32 oz	Copper Sulfate/Phosphoric Acid
Oil & Grease	Amber Glass	32 oz	Sulfuric Acid

NOTES:

1. Volatile Organics Analysis - EPA Priority Pollutants
2. Nonvolatile Base Neutrals + Nonvolatile Acids - EPA Priority Pollutants
3. Analyzed for Total Chromium, Total Copper, Total Lead, Total Nickel, Total Zinc, Total Cadmium, Total Iron
4. Analyzed for pH, Acidity, and Total Suspended Solids (TSS)

TABLE II-2

SUMMARY OF DATA FOR LABORATORY METALS COMPOSITE SAMPLES

Sampling Period	Sampling Location 3-B	8-A	9-A	12-C	Cerro West
	Bottle #/Flow Rate, GPM/% of Sample				
1	3/18/16	1/54/10	4/14/19	2/172/12	5/47/16
2	8/15/14	9/52/9	7/12/16	10/149/11	6/42/15
3	13/15/14	11/102/18	14/11/15	12/132/9	15/41/14
4	18/16/15	16/109/20	17/12/16	20/204/15	19/46/16
5	23/18/16	24/106/19	22/12/16	25/325/23	21/50/17
6	29/28/25	29/132/24	27/13/18	30/409/29	26/61/21

TABLE II-3

FLOW MEASUREMENT DEVICE FOR EACH SAMPLING LOCATION

	Pipe		Device	
Location	Type	Size (in.)	Type	Size (in.)
3-B	Cast Iron	12	90 Degree V-Notch weir with continuous flowmeter/recorder	-
8-A	Clay	12	90 Degree V-Notch weir with continuous flowmeter/recorder	-
9-A	Cast Iron	12	90 Degree V-Notch weir with continuous flowmeter	-
12-C	(Pumped Flow)	-	Sonic Flow Meter	-
Cerro West	Clay	18	Rectangular Flume with Continuous Flowmeter/Recorder	18.0

III SUMMARY OF FLOW MONITORING DATA

Flow data were compiled during the 24-hour sampling period by periodically reading the totalizers associated with each flow meter. The data are presented in Table III-1. The flow rates in the table are calculated average flows based on recorded totalizer readings and the time intervals between readings.

TABLE III-1

CERRO COPPER PRODUCTS
PCR MONITORING
FLOW RATE MEASUREMENT SUMMARY

Reading	Date	3-B		8-A		9-A		12-C		Cerro West	
		Time*	Flow#	Time	Flow	Time	Flow	Time	Flow	Time	Flow
1	12-6	0905	18+	0845	54	0915	14	0855	172	0930	47
2	12-6	1225	15	1235	52	1215	12	1300	149	1200	42
3	12-6	1407	18	1410	59	1405	12	1415	75	1400	48
4	12-6	1625	15	1550	102	1635	11	1615	132	1645	41
5	12-6	2019	16	2026	109	2009	12	2040	204	2000	46
6	12-6	2207	18	2209	98	2204	12	2214	251	2200	46
7	12-7	0014	18	0020	106	0007	12	0028	325	0000	50
8	12-7	0206	23	0208	137	0203	11	0210	426	0200	50
9	12-7	0410	28	0415	132	0405	13	0426	409	0400	61
10	12-7	1012	-	0912	-	1030	-	0930	-	1105	-
Minimum			28		137		14		426		61
Maximum			15		52		11		75		41
Average			18.6		94.3		12.1		238.3		47.9

* Time is based on 24-hour clock
\# Flow is in Gallons/Minute (GPM)
\+ Flows are calculated averages based on recorded totalizer readings and the time interval between readings.

IV INDEX OF ANALYTICAL DATA

SAMPLING LOCATION 3B

		Sample Identification Number*					
Date	Time	Metals#	Oil & Phenols	Water Grease	Chemistry**	VOA	NVBN + NVA
12-6	0905	3	3	3	3	-	-
12-6	1225	8	8	8	8	-	-
12-6	1625	13	13	13	13	-	-
12-6	2019	18	18	18	18	-	-
12-7	0014	23	23	23	23	-	-
12-7	0410	28	28	28	28	-	-
12-7	1012	36	36	36	36	3	-
12-7	1012##	37	37	37	37	-	4

* This index correlates Sample Collection Time and Sample Identification Number for the sample bottles collected during each sampling period. Except for the metals composite samples compiled from the individual metals grab samples, the analytical results presented in Section V are keyed to the Sample Identification Numbers. For the metals composite samples, the results are keyed directly to the Sampling Location.

\# The individual metals samples for each sampling period were used to compile a composite sample for this location.

** The water chemistry bottle was used for analysis of pH, acidity, and total suspended solids.

\#\# Samples taken from the flow proportional composite sample.

IV INDEX OF ANALYTICAL DATA

SAMPLING LOCATION 8A

		Sample Identification Number*					
Date	Time	Metals#	Oil & Phenols	Water Grease	Chemistry**	VOA	NVBN + NVA
12-6	0845	1	1	1	1	-	-
12-6	1235	9	9	9	9	-	-
12-6	1550	11	11	11	11	-	-
12-6	2026	16	16	16	16	-	-
12-7	0020	24	24	24	24	-	-
12-7	0415	29	29	29	29	-	-
12-7	0912	31	31	31	31	1	-
12-7	0912##	35	35	35	35	-	3

* This index correlates Sample Collection Time and Sample Identification Number for the sample bottles collected during each sampling period. Except for the metals composite samples compiled from the individual metals grab samples, the analytical results presented in Section V are keyed to the Sample Identification Numbers. For the metals composite samples, the results are keyed directly to the Sampling Location.

\# The individual metals samples for each sampling period were used to compile a composite sample for this location.

** The water chemistry bottle was used for analysis of pH, acidity, and total suspended solids.

\#\# Samples taken from the flow proprotional composite sample.

IV INDEX OF ANALYTICAL DATA

SAMPLING LOCATION 9A

		Sample Identification Number*					
Date	Time	Metals#	Oil & Phenols	Water Grease	Chemistry**	VOA	NVBN + NVA
12-6	0915	4	4	4	4	-	-
12-6	1215	7	7	7	7	-	-
12-6	1635	14	14	14	14	-	-
12-6	2009	17	17	17	17	-	-
12-7	0007	22	22	22	22	-	-
12-7	0405	27	27	27	27	-	-
12-7	1030	38	38	38	38	4	-
12-7	1030##	39	39	39	39	-	5

* This index correlates Sample Collection Time and Sample Identification Number for the sample bottles collected during each sampling period. Except for the metals composite samples compiled from the individual metals grab samples, the analytical results presented in Section V are keyed to the Sample Identification Numbers. For the metals composite samples, the results are keyed directly to the Sampling Location.

\# The individual metals samples for each sampling period were used to compile a composite sample for this location.

** The water chemistry bottle was used for analysis of pH, acidity, and total suspended solids.

\#\# Samples taken from the flow proportional composite sample.

IV INDEX OF ANALYTICAL DATA

SAMPLING LOCATION 12C

		Sample Identification Number*					
Date	Time	Metals#	Oil & Phenols	Water Grease	Chemistry**	VOA	NVBN + NVA
12-6	0855	2	2	2	2	-	-
12-6	1300	10	10	10	10	-	-
12-6	1615	12	12	12	12	-	-
12-6	2040	20	20	20	20	-	-
12-7	0028	25	25	25	25	-	-
12-7	0426	30	30	30	30	-	-
12-7	0930	32	32	32	32	2	-
12-7	0930##	33/34+	33/34+	33/34+	33/34+	-	1/2+

* This index correlates Sample Collection Time and Sample Identification Number for the sample bottles collected during each sampling period. Except for the metals composite samples compiled from the individual metals grab samples, the analytical results presented in Section V are keyed to the Sample Identification Numbers. For the metals composite samples, the results are keyed directly to the Sampling Location.

\# The individual metals samples for each sampling period were used to compile a composite sample for this location.

** The water chemistry bottle was used for analysis of pH, acidity, and total suspended solids.

\#\# Samples taken from the flow proportional composite sample.

\+ Duplicate sample collected to check on laboratory quality control.

IV INDEX OF ANALYTICAL DATA

SAMPLING LOCATION CERRO WEST

		Sample Identification Number*					
Date	Time	Metals#	Oil & Phenols	Water Grease	Chemistry**	VOA	NVBN + NVA
12-6	0930	5	5	5	5	-	-
12-6	1200	6	6	6	6	-	-
12-6	1645	15	15	15	15	-	-
12-6	2000	19	19	19	19	-	-
12-7	0000	21	21	21	21	-	-
12-7	0400	26	26	26	26	-	-
12-7	1105	40	40	40	40	5/6+	(8/9+)++
12-7	1105##	41/42+	41/42+	41/42+	41/42+	-	-

* This index correlates Sample Collection Time and Sample Identification Number for the sample bottles collected during each sampling period. Except for the metals composite samples compiled from the individual metals grab samples, the analytical results presented in Section V are keyed to the Sample Identification Numbers. For the metals composite samples, the results are keyed directly to the Sampling Location.

\# The individual metals samples for each sampling period were used to compile a composite sample for this location.

** The water chemistry bottle was used for analysis of pH, acidity, and total suspended solids.

\#\# Samples taken from the flow proportional composite sample.

\+ Duplicate sample collected to check on laboratory quality control.

++ Grab samples because of limited amount of sample in composite container. ←

IV INDEX OF ANALYTICAL DATA

SAMPLING LOCATION 30

		Sample Identification Number*					
Date	Time	Metals#	Oil & Phenols	Water Grease	Chemistry**	VOA	NVBN + NVA
12-12	1100	43	43	43	43	~~43~~ 7	~~43~~ 10

* This index correlates Sample Collection Time and Sample Identification Number for the sample bottles collected during each sampling period. The analytical results presented in Section V are keyed to the Sample Identification Numbers.

** The water chemistry bottle was used for analysis of pH, acidity, and total suspended solids.

INDUSTRIAL TESTING LABORATORIES inc.

Chemists
Engineers
Metallurgists

2350 Seventh Blvd. • St. Louis, Missouri 63104 | 314/771-7111

THIS IS OUR 65TH ANNIVERSARY

Report No. 88-12-9375 December 28, 1988

Metals analysis on thirteen (13) wastewater samples submitted 12/7/88 marked, "PCR Monitoring Cerro Copper, Job No. 10027E".

Sverdrup Corporation
801 North Eleventh Street
St. Louis, MO. 63101

Attn: Mr. Larry Oliver

TEST REPORT

Sample Identification	Total Metals, mg/l						
	Cadmium	Chromium	Copper	Iron	Lead	Nickel	Zinc
#33	4.90	0.35	120	6.64	26.6	21.6	83
#34	4.91	0.32	116	6.77	26.4	21.3	81
#35	11.8	0.74	206	14.8	60	44	186
#37	<0.02	0.15	1.29	0.60	0.27	<0.05	0.15
#39	<0.02	0.14	0.99	0.22	<0.01	<0.05	0.16
#41	<0.02	0.10	4.37	0.70	0.44	0.05	0.57
#42	<0.02	0.10	4.40	0.72	0.41	0.05	0.56
Composites:							
Cerro West	<0.02	0.09	1.68	0.30	0.16	<0.05	0.30
Location 8A	9.10	0.43	148	8.36	75	8.77	99
Location 9A	<0.02	0.10	1.05	0.19	<0.1	<0.05	0.14
Location 3B	<0.02	0.06	0.43	0.14	<0.1	<0.05	0.07
Location 12C	7.28	0.27	104	8.69	22.1	21.5	87

INDUSTRIAL TESTING LABORATORIES inc.

Chemists
Engineers
Metallurgists

2350 Seventh Blvd. • St. Louis, Missouri 63104 | 314/771-7111

Report No. 88-12-9375A

January 9, 1989

Examination of one(1) wastewater sample submitted, identified "Cerro Copper Products Co., Sverdrup Job 10027E."

Sverdrup Corporation
801 North Eleventh Street
St. Louis, MO 63101

Attn: Mr. Larry Oliver

TEST REPORT

	Sample #43
Cadmium, mg/l	0.02
Chromium, mg/l	0.05
Copper, mg/l	0.52
Iron, mg/l	<0.05
Nickel, mg/l	<0.05
Lead, mg/l	0.42
Zinc, mg/l	0.07

Respectfully submitted,

Allan M. Siegel

Allan M. Siegel, P.E.
Director

Lab No. 133852
L.B. 30939
RW/bjk

INDUSTRIAL TESTING LABORATORIES inc.

Chemists
Engineers
Metallurgists

2350 Seventh Blvd. • St. Louis, Missouri 63104 | 314/771-7111

THIS IS OUR 65TH ANNIVERSARY

Report No. 88-12-9375A December 29, 1988

Examination of forty-three (43) wastewater samples submitted 12/7/88 marked, "PCR Minitoring, Cerro Copper, Job No. 10027E".

Sverdrup Corporation
801 North Eleventh Street
St. Louis, MO. 63101

Attn: Mr. Larry Oliver

TEST REPORT

Sample Identification	pH	Acidity, mg/l	Total Suspended Solids, mg/l
1	2.34	765	63
2	2.13	1040	184
3	7.82	6	6
4	8.23	1	2
5	8.26	0.5	33
6	8.18	2	46
7	8.45	0	3
8	8.49	0	188
9	6.47	87	180
10	2.70	430	200
11	7.39	17	118
12	6.00	80	270
13	8.21	2	3
14	8.34	0	10
15	8.18	2	144
16	3.77	270	182
17	8.38	0	19
18	8.27	0.5	<1

INDUSTRIAL TESTING LABORATORIES inc.

Report No. 88-12-9375A

Sample Identification	pH	Acidity, mg/l	Total Suspended Solids, mg/l
19	8.23	1	18
20	2.27	790	134
21	8.06	6	20
22	8.15	5	16
23	8.63	0	158
24	5.70	690	442
25	5.97	655	710
26	7.86	29	40
27	7.87	27	1
28	8.10	7	7
29	6.40	250	42
30	7.18	94	628
31	1.29	4575	200
32	3.00	385	500
33	3.24	385	121
34	3.24	370	128
35	2.45	890	260
36	8.03	10	16
37	8.02	12	117
38	8.26	1	<1
39	8.18	4	<1
40	7.96	6	20
41	8.00	6	91
42	8.07	4	71
43	9.97	0	<1

Report No. 88-12-9375A

Sample Identification	Total Phenols, mg/l	Oil & Grease, mg/l
1	0.02	43
2	0.03	121
3	0.04	8
4	0.01	40
5	0.02	26
6	0.04	31
7	0.01	27
8	0.02	34
9	0.03	49
10	0.04	325
11	0.04	61
12	0.03	1050
13	0.02	42
14	0.02	59
15	0.04	72
16	0.01	68
17	0.02	39
18	0.03	48
19	0.02	56
20	0.03	131
21	0.01	16
22	0.01	26
23	0.04	36
24	0.02	32
25	0.03	744
26	0.02	34
27	0.02	66
28	0.02	65
29	0.01	74
30	0.03	242

INDUSTRIAL TESTING LABORATORIES inc.

Report No. 88-12-9375A

Sample Identification	Total Phenols, mg/l	Oil & Grease, mg/l
31	0.01	9
32	0.02	288
33	0.02	194
34	0.03	216
35	0.01	17
36	0.01	5
37	0.04	8
38	<0.01	3
39	<0.01	2
40	0.03	14
41	0.04	84
42	0.04	69
43	0.02	24

ITEM 1

INDUSTRIAL TESTING LABORATORIES inc.

Chemists
Engineers
Metallurgists

2350 Seventh Blvd. • St. Louis, Missouri 63104 | 314/771-7111

Report No. 88-12-9136A

January 25, 1989

Examinaton of water samples submitted 12/07/88.

Cerro Copper Products Company
P. O. Box 681
East St. Louis, IL. 62202

Attn: Mr. Joe Burroughs

TEST REPORT

Volatile Organics Analysis

	8A	12C	3B	9A	21A
Sample I.D.:	1	2	3	4	5
Matrix:	Water	Water	Water	Water	Water
Date of Analysis:	12/19/88	12/19/88	12/19/88	12/19/88	12/19/88
Method:	8240	8240	8240	8240	8240
Units:	ug/l	ug/l	ug/l	ug/l	ug/l
Chloromethane	<10	<10	<10	<10	<10
Bromomethane	<10	<10	<10	<10	<10
Vinyl Chloride	<10	<10	<10	<10	<10
Chloroethane	<10	<10	<10	<10	
Methylene Chloride	<5	<5	<5	<5	<5
1,1-Dichloroethylene	<5	<5	<5	<5	12
1,1-Dichloroethane	<5	<5	10	<5	26
trans-1,2-Dichloroethylene	<5	<5	<5	<5	5
Chloroform	<5	7	19	<5	20
1,2-Dichloroethane	<5	<5	<5	<5	<5
1,1,1-Trichloroethane	71	57	310[a]	<5	2300[a]
Carbon Tetrachloride	<5	<5	<5	<5	<5
Bromodichloromethane	<5	<5	<5	<5	5
cis-1,3-Dichloropropylene	<5	<5	<5	<5	<5
Trichloroethylene	17	15	5	<5	24
Benzene	<5	<5	<5	<5	<5

a - out of calibration range; analysis performed on diluted sample.

Volatile Organics Analysis

Sample I.D.:	1	2	3	4	5
Dibromochloromethane	<5	<5	<5	<5	<5
1,1,2-Trichloroethane	<5	<5	<5	<5	<5
trans-1,3-Dichloropropylene	<5	<5	<5	<5	<5
Bromoform	<5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	<5	<5	<5	<5	<5
Tetrachloroethylene	<5	<5	<5	<5	<5
Toluene	<5	<5	<5	<5	<5
Chlorobenzene	<5	<5	<5	<5	<5
Ethylbenzene	<5	<5	<5	<5	<5
1,2-Dichloropropane	<5	<5	<5	<5	<5

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Volatile Organics Analysis

Sample I.D.:	6	7
Matrix:	Water	Water
Date of Analysis:	12/19/88	12/19/88
Method:	8240	8240
Units:	ug/l	ug/l
Chloromethane	<10	<10
Bromomethane	<10	<10
Vinyl Chloride	<10	<10
Chloroethane	<10	<10
Methylene Chloride	<5	<5
1,1-Dichloroethylene	11	<5
1,1-Dichloroethane	23	<5
trans-1,2-Dichloroethylene	5	<5
Chloroform	20	6
1,2-Dichloroethane	<5	<5
1,1,1-Trichloroethane	1400[a]	15
Carbon Tetrachloride	<5	<5
Bromodichloromethane	5	<5
cis-1,3-Dichloropropylene	<5	<5
Trichloroethylene	23	<5
Benzene	<5	<5
Dibromochloromethane	<5	<5
1,1,2-Trichloroethane	<5	<5
trans-1,3-Dichloropropylene	<5	<5
Bromoform	<5	<5
1,1,2,2-Tetrachloroethane	<5	<5
Tetrachloroethylene	<5	<5
Toluene	<5	<5
Chlorobenzene	<5	<5
Ethylbenzene	<5	<5
1,2-Dichloropropane	<5	<5

Respectfully submitted,

Allan M. Siegel, P.E.
Director

Lab No. 133153
JWS/WR/hj

Inv. #26635

INDUSTRIAL TESTING LABORATORIES inc.

Chemists
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Metallurgists

2350 Seventh Blvd. • St. Louis, Missouri 63104 | 314/771-7111

Report No. 88-12-9136B January 25, 1989

Examinaton of water samples submitted 12/07/88.

Cerro Copper Prcducts Company
P. O. Box 681
East St. Louis, IL. 62202 Attn: Mr. Joe Burroughs

TEST REPORT

Base/Neutral Extractable Organics Analysis

Sample I.D.:	1	2	3	4	5
Matrix:	Water	Water	Water	Water	Water
Date of Analysis:	1/9/89	1/9/89	1/9/89	1/9/89	1/9/89
Method:	8270	8270	8270	8270	8270
Units:	ug/l	ug/l	ug/l	ug/l	ug/l
Acenaphthene	<10	<10	<10	<10	<10
Acenaphthylene	<10	<10	<10	<10	<10
Anthracene	<10	<10	<10	<10	<10
Benzidine	<25	<25	<25	<25	<25
Benzo(a)anthracene	<10	<10	<10	<10	<10
Benzo(a)pyrene	<10	<10	<10	<10	<10
Benzo(b)fluoranthene	<10	<10	<10	<10	<10
Benzo(ghi)perylene	<10	<10	<10	<10	<10
Benzo(k)fluoranthene	<10	<10	<10	<10	<10
bis(2-Chloroethoxy) methane	<10	<10	<10	<10	<10
bis(2-Chloroethyl)ether	<10	<10	<10	<10	<10
bis(2-Chloroisopropyl) ether	<10	<10	<10	<10	<10
bis(2-Ethylhexyl) phthalate	46	50	<10	<10	<10
4-Bromophenyl phenyl ether	<10	<10	<10	<10	<10

Base/Neutral Extractable Organics Analysis (con't.)

Sample I.D.:	1	2	3	4	5
Butylbenzyl phthalate	<10	<10	<10	<10	<10
2-Chloronaphthalene	<10	<10	<10	<10	<10
4-Chlorophenyl phenyl ether	<10	<10	<10	<10	<10
Chrysene	<10	<10	<10	<10	<10
Dibenzo(a,h)anthracene	<10	<10	<10	<10	<10
1,2-Dichlorobenzene	<10	<10	<10	<10	<10
1,3-Dichlorobenzene	<10	<10	<10	<10	<10
1,4-Dichlorobenzene	<10	<10	<10	<10	<10
3,3'-Dichlorobenzidine	<10	<10	<10	<10	<10
Disthyl phthalate	<10	<10	<10	<10	<10
Dimethyl phthalate	<10	<10	<10	<10	<10
Di-n-butyl phthalate	<10	<10	<10	<10	<10
2,4-Dinitrotoluene	<10	<10	<10	<10	<10
2,6-Dinitrotoluene	<10	<10	<10	<10	<10
Di-n-octyl phthalate	<10	<10	<10	<10	<10
1,2-Diphenylhydrazine	<25	<25	<25	<25	<25
Fluoranthene	<10	<10	<10	<10	<10
Fluorene	<10	<10	<10	<10	<10
Hexachlorobenzene	<10	<10	<10	<10	<10
Hexachlorobutadiene	<10	<10	<10	<10	<10
Hexachlorocyclo pentadiene	<10	<10	<10	<10	<10
Hexachloroethane	<10	<10	<10	<10	<10
Indeno(1,2,3-cd)pyrene	<10	<10	<10	<10	<10
Isophorone	<10	<10	<10	<10	<10
Naphthalene	<10	<10	<10	<10	<10
Nitrobenzene	<10	<10	<10	<10	<10
N-Nitrosodimethylamine	<25	<25	<25	<25	<25
N-Nitrosodi-n-propyl amine	<10	<10	<10	<10	<10
N-Nitrosodiphenylamine	<10	<10	<10	<10	<10
Phenanthrene	<10	<10	<10	<10	<10
Pyrene	<10	<10	<10	<10	<10
1,2,4-Trichlorobenzene	<10	<10	<10	<10	<10

Base/Neutral Extractable Organics Analysis

Sample I.D.:	8	9	10
Matrix:	Water	Water	Water
Date of Analysis:	1/9/89	1/9/89	1/9/89
Method:	8270	8270	8270
Units:	ug/l	ug/l	ug/l
Acenaphthene	<10	<10	<10
Acenaphthylene	<10	<10	<10
Anthracene	<10	<10	<10
Benzidine	<25	<25	<25
Benzo(a)anthracene	<10	<10	<10
Benzo(a)pyrene	<10	<10	<10
Benzo(b)fluoranthene	<10	<10	<10
Benzo(ghi)perylene	<10	<10	<10
Benzo(k)fluoranthene	<10	<10	<10
bis(2-Chloroethoxy) methane	<10	<10	<10
bis(2-Chloroethyl)ether	<10	<10	<10
bis(2-Chloroisopropyl) ether	<10	<10	<10
bis(2-Ethylhexyl) phthalate	<10	<10	<10
4-Bromophenyl phenyl ether	<10	<10	<10
Butylbenzyl phthalate	<10	<10	<10
2-Chloronaphthalene	<10	<10	<10
4-Chlorophenyl phenyl ether	<10	<10	<10
Chrysene	<10	<10	<10
Dibenzo(a,h)anthracene	<10	<10	<10
1,2-Dichlorobenzene	<10	<10	<10
1,3-Dichlorobenzene	<10	<10	<10
1,4-Dichlorobenzene	<10	<10	<10
3,3'-Dichlorobenzidine	<10	<10	<10
Diethyl phthalate	<10	<10	<10
Dimethyl phthalate	<10	<10	<10
Di-n-butyl phthalate	<10	<10	<10
2,4-Dinitrotoluene	<10	<10	<10
2,6-Dinitrotoluene	<10	<10	<10
Di-n-octyl phthalate	<10	<10	<10
1,2-Diphenylhydrazine	<25	<25	<10

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Base/Neutral Extractable Organics Analysis (con't.)

Sample I.D.:	8	9	10
Fluoranthene	<10	<10	<10
Fluorene	<10	<10	<10
Hexachlorobenzene	<10	<10	<10
Hexachlorobutadiene	<10	<10	<10
Hexachlorocyclo pentadiene	<10	<10	<10
Hexachloroethane	<10	<10	<10
Indeno(1,2,3-cd)pyrene	<10	<10	<10
Isophorone	<10	<10	<10
Naphthalene	<10	<10	<10
Nitrobenzene	<10	<10	<10
N-Nitrosodimethylamine	<25	<25	<25
N-Nitrosodi-n-propyl amine	<10	<10	<10
N-Nitrosodiphenylamine	<10	<10	<10
Phenanthrene	<10	<10	<10
Pyrene	<10	<10	<10
1,2,4-Trichlorobenzene	<10	<10	<10

Respectfully submitted,

Allan M. Siegel

Allan M. Siegel, P.E.
Director

Lab No. 133153
JWS/WR/hj

Inv. #26635

INDUSTRIAL TESTING LABORATORIES inc.

Chemists
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Metallurgists

2350 Seventh Blvd. • St. Louis, Missouri 63104 | 314/771-7111

Report No. 88-12-9136C January 25, 1989

Examinaton of water samples submitted 12/07/88.

Cerro Copper Products Company
P. O. Box 681
East St. Louis, IL. 62202 Attn: Mr. Joe Burroughs

TEST REPORT

Acid Extractable Organics Analysis

Sample ID:	1	2	3	4	5
Matrix:	Water	Water	Water	Water	Water
Date of Analysis:	1/9/89	1/9/89	1/9/89	1/9/89	1/9/89
Method:	8270	8270	8270	8270	8270
Units:	ug/l	ug/l	ug/l	ug/l	ug/l
2-Chlorophenol	<10	<10	<10	<10	<10
2,4-Dichlorophenol	<10	<10	<10	<10	<10
2,4-Dimethylphenol	<10	<10	<10	<10	<10
2-Methyl-4,6-dinitrophenol	<50	<50	<50	<50	<50
2,4-Dinitrophenol	<50	<50	<50	<50	<50
2-Nitrophenol	<10	<10	<10	<10	<10
4-Nitrophenol	<50	<50	<50	<50	<50
4-Chloro-3-methylphenol	<20	<20	<20	<20	<20
Pentachlorophenol	<50	<50	<50	<50	<50
Phenol	<10	<10	<10	<10	<10
2,4,6-Trichlorophenol	<10	<10	<10	<10	<10

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Acid Extractable Organics Analysis (con't.)

Sample ID:	8	9	10
Matrix:	Water	Water	Water
Date of Analysis:	1/9/89	1/9/89	1/9/89
Method:	8270	8270	8270
Units:	ug/l	ug/l	ug/l
2-Chlorophenol	<10	<10	<10
2,4-Dichlorophenol	<10	<10	<10
2,4-Dimethylphenol	<10	<10	<10
2-Methyl-4,6-dinitrophenol	<50	<50	<50
2,4-Dinitrophenol	<50	<50	<50
2-Nitrophenol	<10	<10	<10
4-Nitrophenol	<50	<50	<50
4-Chloro-3-methylphenol	<20	<20	<20
Pentachlorophenol	<50	<50	<50
Phenol	<10	<10	<10
2,4,6-Trichlorophenol	<10	<10	<10

Respectfully submitted,

Allan M. Siegel

Allan M. Siegel, P.E.
Director

Lab No. 133153
JWS/WR/hj

Inv. #26635

INDUSTRIAL TESTING LABORATORIES inc.

Chemists
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Metallurgists

2350 Seventh Blvd. • St. Louis, Missouri 63104 | 314/771-7111

Report No. 88-12-9136D January 25, 1989

Examinaton of water samples submitted 12/07/88.

Cerro Copper Products Company
P. O. Box 681
East St. Louis, IL. 62202 Attn: Mr. Joe Burroughs

TEST REPORT

Pesticide/PCB's Analysis

Sample ID:	1	2	8	9
Matrix:	Water	Water	Water	Water
Date of Analysis:	1/9/89	1/9/89	1/9/89	1/9/89
Method:	8080	8080	8080	8080
Units:	ug/l	ug/l	ug/l	ug/l
Aldrin	<0.04	<0.04	<0.04	<0.04
alpha-BHC	<0.03	<0.03	<0.03	<0.03
beta-BHC	<0.06	<0.06	<0.06	<0.06
gamma-BHC (Lindane)	<0.04	<0.04	<0.04	<0.04
delta-BHC	<0.09	<0.09	<0.09	<0.09
Chlordane	<0.14	<0.14	<0.14	<0.14
-DDT	<0.12	<0.12	<0.12	<0.12
4,4'-DDE	<0.04	<0.04	<0.04	<0.04
4,4'-DDD	<0.11	<0.11	<0.11	<0.11
Dieldrin	<0.02	<0.02	<0.02	<0.02
alpha-Endosulfan (I)	<0.14	<0.14	<0.14	<0.14
beta-Endosulfan (II)	<0.04	<0.04	<0.04	<0.04
Endosulfan sulfate	<0.66	<0.66	<0.66	<0.66
Endrin	<0.06	<0.06	<0.06	<0.06
Endrin aldehyde	<0.23	<0.23	<0.23	<0.23
Heptachlor	<0.03	<0.03	<0.03	<0.03
Heptachlor epoxide	<0.83	<0.83	<0.83	<0.83

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Pesticide/PCB's Analysis (con't.)

Sample I.D.:	1	2	8	9
PCB-1242	<0.65	<0.65	<0.65	<0.65
PCB-1254	<0.65	<0.65	<0.65	<0.65
PCB-1221	<0.65	<0.65	<0.65	<0.65
PCB-1232	<0.65	<0.65	<0.65	<0.65
PCB-1248	<0.65	<0.65	<0.65	<0.65
PCB-1260	<0.65	<0.65	<0.65	<0.65
PCB-1016	<0.65	<0.65	<0.65	<0.65
Toxaphene	<2.40	<2.40	<2.40	<2.40

Respectfully submitted,

Allan M. Siegel

Allan M. Siegel, P.E.
Director

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Inv. #26635

ITEM 2

IV INDEX OF ANALYTICAL DATA

SAMPLING LOCATION 30

		Sample Identification Number*					
Date	Time	Metals#	Oil & Phenols	Water Grease	Chemistry**	VOA	NVBN + NVA
12-12	1100	43	43	43	43	~~43~~ 7	~~43~~ 10

* This index correlates Sample Collection Time and Sample Identification Number for the sample bottles collected during each sampling period. The analytical results presented in Section V are keyed to the Sample Identification Numbers.

** The water chemistry bottle was used for analysis of pH, acidity, and total suspended solids.